P.E.Meehl: Philosophical Psychology Seminar

Lecture 9 (of 12) 03/02/1989

Probability (cont.); repeat end of last lecture to clarify:

Probability we usually use in psychology is probability$_2$: Proportion in a class, percentage, relative frequency of events or properties; a decimal value $0 \leq p \leq 1$ closed interval; "certainty" = ($p = 1$), but not conversely

Object language. Properties of physical objects or events in a domain (genetics, chemistry, psychology, economics)
19th century, John Venn; and Ellis defined by relative frequency

Kolmogoroff, axiomatized probability calculus. *P* not *defined* by reference to relative frequency. Only 3 postulates about probability numbers. All abstract. Have to coordinate linkages of the *p*-numbers with empirical proportions. I don't know how to do that.

Popper. Probability is a *propensity* (= tendency, disposition), and a formal axiom system. Thinks you need more axioms than 3.

Fisher is a frequentist, but not the Mises-Reichenbach kind. Introduce π by axiom, then *prove* it relates to a frequency.

Psychology students think frequency is the only kind of probability there is, from way statistics is taught. Another kind of probability (life, law courts, even science) doesn't *look* like a relative frequency.

Historical fact (e.g., Katyn massacre) on evidence, doesn't look like any kind of frequency.

Kaspar Hauser son of a prince? How express a probability of that as a frequency? Only one such person.

Wegener theory of continental drift. If no other planets exist, still meaningful to say "Wegener's theory is probable on the evidence."

Facts may be statistical or not. But that doesn't make the evidentiary relation *between* facts and theory statistical.

Schizophrenia is a neurological disorder, on the evidence *p*(T/F) has no algorithm to get a *p-number*. Bayesian subjectivists *extract* a *p*-number by forcing people to bet. It works.

But those subjective betting odds are not reached by computing a frequency.

Start with Carnap's probability$_1$ and probability$_2$ prima facie distinction; *then* inquire whether they can be identified, or how related if distinct. Probability$_1$ is about relation between beliefs, statements, propositions–rather than relations between events or properties of physical events

Can always avoid facts (Flat Earth Society)

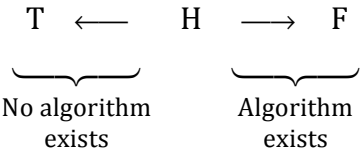
Cardinal Newman's book *Grammar of Assent* is great on probability$_1$

Example: Evidence that Hauptman killed Lindbergh baby [passout]

Example: Snyder's genetics text (pre-1953) that genes are located on chromosomes [passout]

Any juror has to estimate probability$_1$ without algorithm

Scientific theories are probability$_1$ on evidence (Piaget, Darwin, Freud, Big Bang) not numerified by an algorithm



probability$_1$ called “logical probability”

Carnap worked on a probability$_1$ algorithm
Most don’t think it worked
Perfect ideal language of state-descriptives
“Principle of Indifference” or “Principle of Insufficient Reason” applied to state descriptions can give an algorithm [Grover Maxwell story on state descriptions]

Probability$_1$ and probability$_2$ prima facie different, and we need both kinds
“Probability is the guide of life” (Bishop Butler)

Query: Yet how are they basically the same? How come same term used for both (in most languages)?

[Randomness of von Mises collectives is called “Principle of Impossibility of a Gambling System”]

von Mises said shouldn’t use term ‘probability’ at all, for probability$_1$.

Reichenbach said only one meaning, limit of relative frequency, for both kinds.

Hard to defend. Example: Probability$_1$ of scientific theories would really be relative frequency of truth for theories having certain properties.

Some of our most fundamental concepts are fuzzy. Example: Probability; causality.

Why one word? Carnap: “Fair betting odds.” Subjective Bayesians even *define* probability that way.

If truth-frequency in long run doesn’t match a purported probability$_1$ algorithm, algorithm is defective. Example: 1000 murder cases where truth is known; a jury algorithm for evaluating evidence should agree; otherwise it’s no good however logically plausible it seems. In that sense relative frequency has a basic status in all probability concepts. So identity theorists like Reichenbach have a point.

de Finetti, Savage “Dutch Book” argument.

Conceptually distinct, yet probability$_2$ and probability$_1$ should tend to agree in long run.

<u>Clinical vs statistical prediction</u>
Autobiographical note: My Freudian interests vs 1938–1945 Minnesota department (anti-Freudian, behaviorist, statistical)

Examples: Law school admissions; criminal parole; suicide risk; EST or pills.
Serious matters. (“Help,” “change” presupposes prediction.)

Doing nothing is a form of action, a decision, based on estimate of effects of options. All such predictions are probabilistic and will remain so. Some physical sciences also stochastic (e.g., meteorology).

Meteorology predictions only 15% better than “persistence” prediction

Closed outcome set: Defined predictive task

Almost all such judgments are made by “informal” method (reflect, discuss, vote, or chief decide). On any given day in USA, 99.9% of all decisions about human behavior are made informally.

Kind of data vs mode of combining them

Other way: Once data encoded, a mechanical way, algorithm, puts data together → prediction. “Actuarial” “statistical” But also can make a mechanical rule non-actuarially (armchair)